

**Advanced Power System Protection****(Power System and Control Automation)****Date: 31-07-2025****Time: 3 Hours.****Max. Marks: 70****Answer ONE Question from each UNIT and each question carries 14 Marks**

UNIT-1

1. Explain how an amplitude comparator can be converted to phase comparator and phase comparator can be converted to amplitude comparator [14 Marks;CO1;Understand]
(OR)
2. Explain different types of protective relays based on the technology used [14 Marks;CO1;Understand]

UNIT-2

3. A) Explain the operation of Rectifier bridge type phase comparator [7 Marks;CO2;Understand]
B) Explain the operation of Sampling comparator [7 Marks;CO2;Understand]
(OR)
4. Explain the significance of amplitude comparators in protection and briefly explain the operation of any two types of amplitude comparators [14 Marks;CO2;Understand]

UNIT-3

5. Explain the principle of operation of static directional over current relay with a neat diagram [14 Marks;CO3;Understand]
(OR)
6. Explain how an elliptical characteristic is realized using static comparator? [14 Marks;CO3;Apply]

UNIT-4

7. What is carrier current protection? Explain the phase comparison scheme of carrier current protection with a neat diagram. [14 Marks;CO4;Understand]
(OR)
8. A) Explain the operation of Balanced voltage (opposed voltage) wire Pilot relaying scheme for the protection of transmission line sections [7 Marks;CO4;Understand]
B) Explain the operation of Circulating current wire Pilot relaying scheme [7 Marks;CO4;Understand]

UNIT-5

9. Explain the operation of numerical over current relay with the help of block diagram [14 Marks;CO5;Understand]
(OR)
10. Explain Differential equation technique for numerical relaying [14 Marks;CO5;Apply]

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